

Title: Post Doc position on the design and characterization of submillimeter-wave frequency multipliers using European Schottky technology.

Location: Observatoire de Paris - Laboratoire d'Etude du Rayonnement et la Matière en Astrophysique (LERMA), 61 avenue de l'Observatoire, 75014 Paris, France

Project: Millimetre-wave Integrated Diode and Amplifier Sources (MIDAS), in the frame of EU SEVENTH FRAMEWORK PROGRAMME - THEME 9: Space Technologies

Duration: two years with a possible extension to three years, starting in March 2010.

Salary: 2000€ net/month + social security and retirement benefits.

Context: The terahertz (THz) spectral region between microwaves and infrared is of crucial importance to current and future space science, Earth observation and astronomy missions. As well as major international astronomy instruments currently under development (ALMA) or deployment (Herschel HIFI) a number of cosmological and planetary science proposals have been submitted to the ESA Cosmic Vision 2015-2025 programme. In Earth observation, passive remote sensing of the atmosphere from space at millimetre and sub-millimetre wavelengths is expected to play a key role in the evolving EU/ESA GMES Sentinel and Eumetsat post-EPS programmes; terahertz radio measurements will be directed towards processes linking atmospheric composition and climate, notably including the GCOS-designated essential climate variables water vapour and ozone.

Despite these, and other potential applications that span the physical, biological, and medical sciences, the terahertz spectrum has yet to be fully exploited. In part this is because it remains difficult to generate conveniently useful amounts of power at THz frequencies. It is to address this problem, by developing generic integrated Schottky diode and amplifier sources using European technology, that the MIDAS project is aimed.

The primary objective of this project is to demonstrate a 125 mW source operating from 270 - 300 GHz, using European device technology (MMIC power amplifiers and Schottky varactor diode circuits), in conjunction with power combining technology.

MIDAS is an approved EU-FP7 project lead by the Rutherford Appleton Laboratory (RAL), Science and Technology Facilities Council. Also, involved in the project, are the Technical University of Madrid, Radiometer Physics GmbH (Germany) and the Observatoire de Paris which is responsible for the designs of the frequency multipliers to be built by the Rutherford Appleton Laboratory.

Laboratory: the post doctoral researcher will join the microwave group of Laboratoire d'Etude du Rayonnement et de la Matière en Astrophysique at the Observatory of Paris and will work with Dr. Alain Maestrini. LERMA has been involved for many years in the design and the fabrication of SIS and Schottky mixers, frequency multipliers, quasi-optical systems and complete receivers; it was responsible for HIFI band 1 (480-640 GHz) SIS mixer on the Herschel space telescope. LERMA has also a long-term collaboration on THz local oscillator design with the Jet Propulsion Laboratory (NASA) and has been working in close collaboration with the Rutherford Appleton laboratory on ESA RTD projects for over five years.

Work: the post doctoral researcher will design several novel frequency multipliers for the Schottky diode technology developed at RAL in the frame of the MIDAS project. He or she will focus on power management and advance power combining techniques and will undertake some RF characterization at LERMA as well. In addition to this activity, the post doctoral researcher will have to contribute to the project progress reports and meetings. Full access to industry-grade simulation tools like Ansys HFSS, Agilent ADS as well as powerful servers will be available. He or she will have the full support and assistance of Dr. Maestrini for his or her work. He or she will interact with the technical University of Madrid for physics based simulations of Schottky diodes. A budget for traveling to international conferences and for small expenses will be granted.

Requirements: the desire of working in RTD programs on THz technologies and improving his or her knowledge of the field. The ability to work in a consortium environment and to respect project deadlines. The position is opened to applicants of any nationality with a Ph.D. degree, preferably in Electrical engineering or alternatively in physics, and with some experience in microwave circuit design or characterization. Knowledge of sub-millimeter wave technology is an advantage. Ability to communicate in English is compulsory.

Contact: applicants can contact Dr. Alain Maestrini
by E-mail at: alain.maestrini@obspm.fr
or by phone at : +33 1 40 51 20 37

Candidacies will be considered until February 28th, 2010, or until the position is filled.